No. 694,208. Patented Feb. 25, 1902.

J. H. SMITH.

EXPANSIBLE TREE PROTECTOR.

(Application filed Nov. 6, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

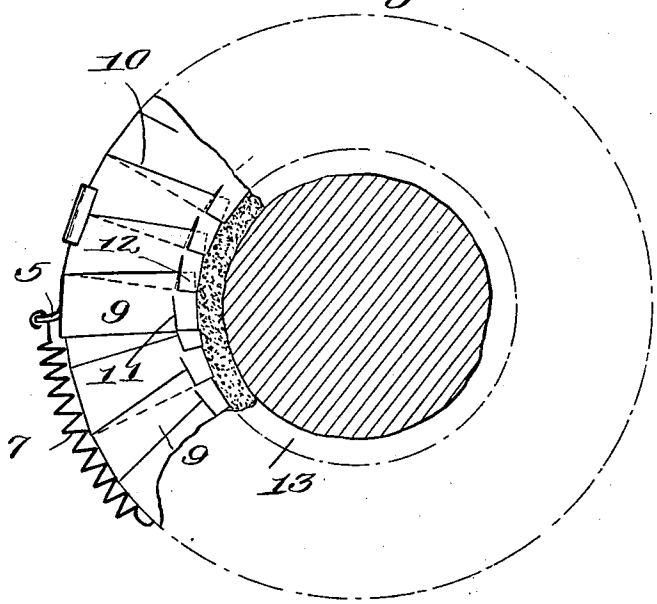


Fig. 2.

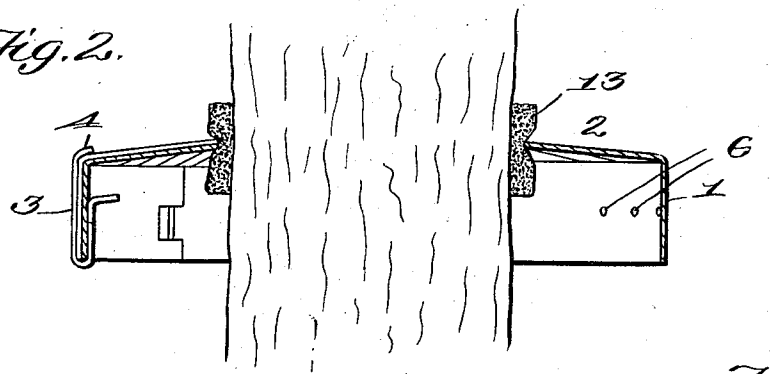


Fig. 3.

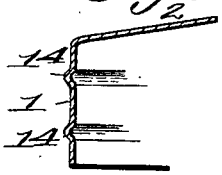


Fig. 4.

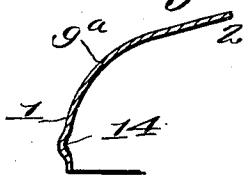


Fig. 5.

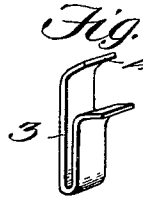
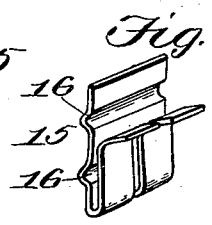


Fig. 6.



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No. 694,208. Patented Feb. 25, 1902.

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(No Model.) 3 Sheets—Sheet 2.

Fig. 7.

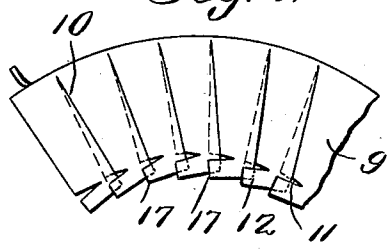


Fig. 8.

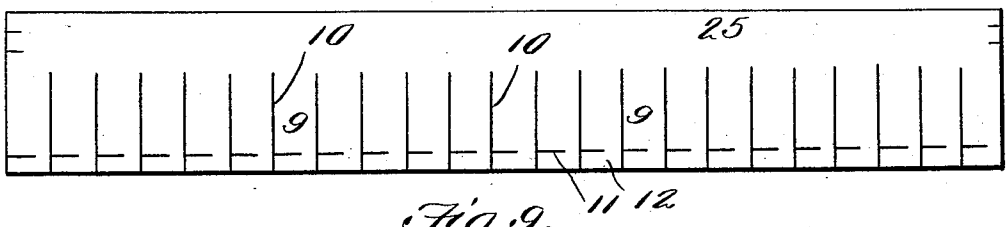


Fig. 9.

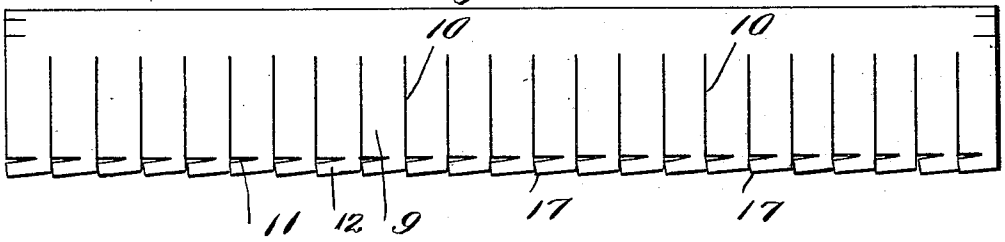


Fig. 10.

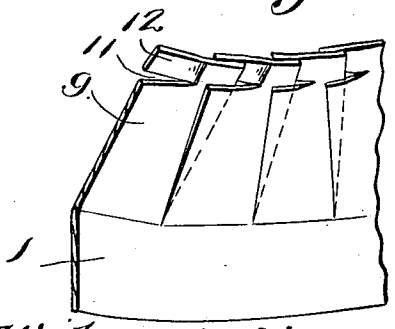
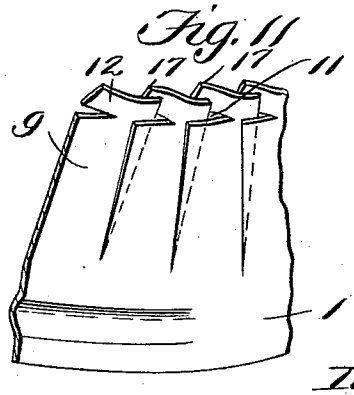


Fig. 11.



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No. 694,208. Patented Feb. 25, 1902.

J. H. SMITH.

EXPANSIBLE TREE PROTECTOR.

(Application filed Nov. 6, 1901.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 12.

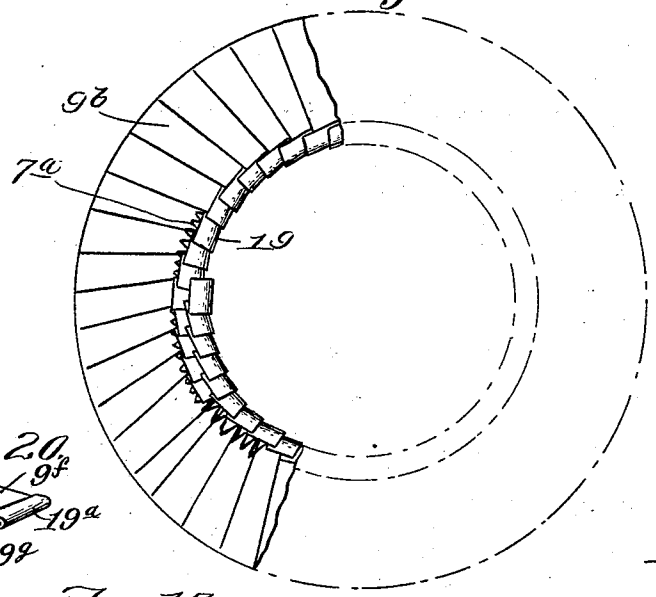


Fig. 20.

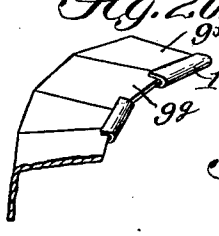


Fig. 21.

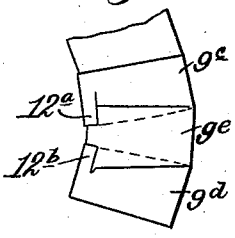


Fig. 13.

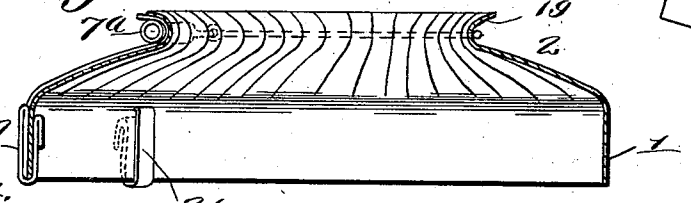


Fig. 14.

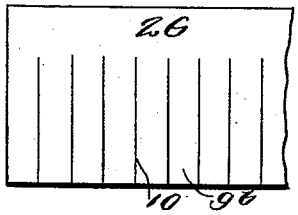


Fig. 15.

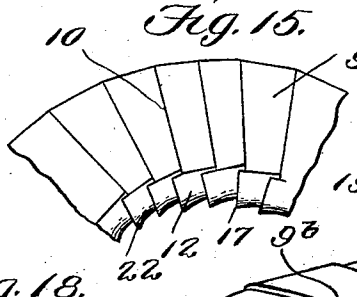


Fig. 16.

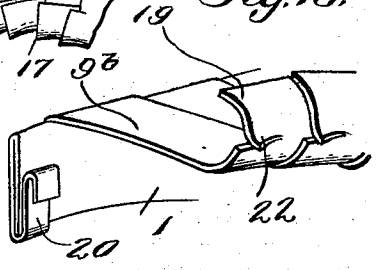


Fig. 17.

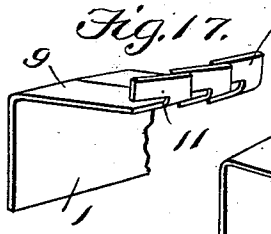


Fig. 18.

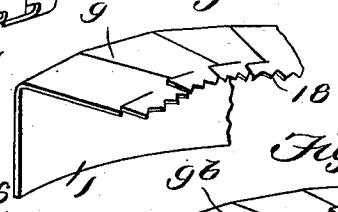
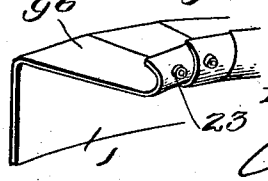


Fig. 19.



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UNITED STATES PATENT OFFICE.

JAY HUNGERFORD SMITH, OF ROCHESTER, NEW YORK.

EXPANSIBLE TREE-PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 694,208, dated February 25, 1902.

Application filed November 6, 1901. Serial No. 81,339. (No model.)

To all whom it may concern:

Be it known that I, JAY HUNGERFORD SMITH, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Expansible Tree-Protectors, of which the following is a specification.

My invention relates to expansible tree-protectors of that class which are placed around or caused to encircle the trunk of the tree for the purpose of preventing the passage of worms or insects along the trunk, but are capable of expansion to accommodate themselves to the growth and consequent increase in diameter of the tree.

The object of the invention is to provide a simple, cheap, and effective protector of this kind in hood form, which may be constructed as a whole from sheet metal or other like material, may be used with a felt or other packing around the bark, and is impervious at all its joints to the passage of worms, insects, and the like.

It is intended to manufacture and sell my improved protector in the form of a continuous web or blank which may be readily cut up by the purchaser or user into the desired lengths for the formation of the completed protectors of proper sizes and dimensions to fit the trees upon which they are desired to be used. My invention resides, therefore, in the novel construction of the protector itself, as well as in the novel construction of the blank from which the protector is made.

It is a well-known fact that with most of the old forms of tree-protectors now in use it is necessary for the same to be made complete by the manufacturer, and when these protectors are desired of different sizes and of different shapes to fit trees of various diameters and shapes it is necessary that the sizes and contours of the different trees be furnished to the manufacturer before the protectors can be properly made. By my invention this is entirely overcome, and the cost of the protectors thereby very materially reduced.

My improved protector consists of a hood having the top or upper wall thereof formed by a continuous series of substantially radially arranged tongues, which overlap each other and are provided with interlocking means.

It also consists in the provision upon the inner ends of said tongues of projections designed to engage either the bark of the tree or the felt or other packing material with which the tree is surrounded.

The blank consists of a continuous strip of sheet metal having lateral slits therein extending from one edge thereof to a point adjacent to the opposite edge, forming tongues, which tongues are provided with projections constituting engaging means.

The blank also consists of a continuous web of sheet metal or other material having lateral slits extending from one of the side edges thereof and terminating short of the other side edge thereof, the said slits forming a series of tongues, each of which is provided near its ends with incisions extending at an angle to said slits.

The invention also consists in certain features and details of construction and combinations of parts, which will be hereinafter more fully described and claimed.

In the drawings forming part of this specification, Figure 1 is a plan view of a tree-protector constructed according to my invention. Fig. 2 is a sectional elevation of the same shown applied to the trunk of a tree. Figs. 3 and 4 are detail sectional views showing the configuration at the edges of two different forms of hoods. Figs. 5 and 6 are detail perspective views, respectively, of two different forms of clamp or clip for connecting the meeting ends of the hood. Fig. 7 is a detail plan view of a portion of a protector, showing the lips at the inner end of the tongues bent inwardly to form engaging portions. Fig. 8 is a view of the blank from which the hood shown in Figs. 1 and 2 of the drawings is made. Fig. 9 is also a view of the blank, with the lips on the ends of the tongues bent for the production of the form of hood shown in Fig. 7 of the drawings. Fig. 10 is a detail perspective view of a portion of the hood, showing the overlapping and interlocking tongues constructed and arranged as shown in Figs. 1 and 2. Fig. 11 is a similar view showing the overlapping and interlocking tongues constructed according to the form of hood shown in Fig. 7 of the drawings. Fig. 12 is

a plan view of a modified form of hood. Fig. 13 is a sectional elevation of the same. Fig. 14 is a view of a portion of the blank from which the hood shown in Figs. 12 and 13 is made. Fig. 15 is a detail plan, and Fig. 16 is a detail perspective view, showing one form of engaging portions which may be used on the inner ends of the hook form of tongues shown in Figs. 12 and 13. Fig. 17 is a detail perspective view showing the lips at the inner ends of the tongues bent upwardly into vertical position. Fig. 18 is a detail perspective view showing serrations, which constitute the engaging portions along the inner edges of the overlapping tongues. Fig. 19 is a detail perspective view of the burs, which may be used as engaging portions on the inner ends of the hook form of tongues; and Figs. 20 and 21 are detail views showing modifications of the interlocking tongues.

Like reference-numerals indicate like parts in the different views.

My improved protector is preferably made from sheet metal and is in the form of an annular hood comprising the side flange or rim 1 and the top or cover 2. The same is bent into annular or substantially circular form and the meeting ends of the web or strip from which the hood is made are caused to overlap each other and to have a sliding connection with each other. To prevent separation of the meeting ends of the flange 1, I provide a clamp or coupling-piece 3, which holds the meeting ends of said flange in contact with each other, but permits of the sliding movement of one end with respect to the other. The said clamp may be in the form of a clip made from sheet metal and embracing the meeting ends of the flange or rim 1. The upper outer end of said clamp has an inwardly-extending lip 4, which overlaps or projects above the surface of the top 2, so as to prevent its accidental displacement from the hood after it has been once applied. One end of the rim or flange 1 is provided with an outwardly-extending lip or projection 5, and the other end of said rim or flange is provided with a plurality of openings 6. Connected with the lip 5 and with one or the other of the openings 6 is a contractile spring 7, which permits of the expansion of the hood, but tends to maintain the same in contracted position. By providing a plurality or series of openings 6 into which one end of the spring 7 is inserted I am enabled to adjust the tension of the spring 7 to accommodate the device to the particular conditions under which it is used. It will of course be obvious that for the lip 5 and the openings 6 any other equivalent means of connecting the spring 7 with the hood may be substituted. In fact, any other form of spring may be employed and the same may be differently disposed from that herein shown. The top 2 of the hood extends inwardly from the rim or flange 1 and is formed by a continuous unbroken series of substantially radially arranged tongues 9, which are interlocked with each other at their inner ends. The tongues 9 are formed by transverse slits 10 in the blank from which the hood is made, the said slits extending parallel to each other from one edge of said blank and terminating a short distance from the other edge. The inner ends of the tongues 9 are provided with incisions 11, which extend at an angle to the slits 10 and form the lips 12, as clearly shown. When the hood is in its completed condition, the tongues 9 overlap each other and each of the same fits within the incision 11 of the next adjacent tongue and lies beneath the lip 12, which is formed by said incision. In this way all of the tongues are interlocked with each other and are held in close contact, so that a stronger structure is produced and separation of one of said tongues from the others is prevented. As this separation is prevented all interstices or spaces between the tongues 9 at their joints are maintained closed and the passage of insects, worms, and the like between the tongues 9 is effectually cut off.

It will be seen that when my device is applied to the trunk of the tree it is maintained in close contact therewith at the inner ends of the tongues 9, but is capable of expansion to accommodate itself to the growth and consequent increase in diameter of the tree. During this expansion the tongues 9 move slightly one upon the other, but maintain their same close surface-contact at all times. The hood may be used in connection with a band 13 of felt or other packing material which encircles the trunk of the tree, in which case the device is so disposed that the inner ends of the tongues 9 will lie in close frictional contact with said band. By reason of the peculiar construction of my device it is, moreover, adapted to be readily shaped to conform to any irregularities in the cross-sectional contour of the particular tree on which it is intended to use the same by merely bending the rim or flange of the hood to the shape desired. When this is done, the top 2, made up of the overlapping tongues 9, will follow the shaping or bending of the rim and fit in close even contact with the irregular surface of the tree at all points.

For securing greater rigidity in the construction I may form in the rim or flange 1 of the hood one or more beads or corrugations 14, and in lieu of the clamp or clip 3 I may employ a clamp or clip which is made from a section of the blank from which the hood is made, the said clip 15 being bent at an intermediate point to embrace the opposite sides of the meeting ends of the rim or flange 1 and having the beads or corrugations 16 therein which coöperate with the beads or corrugations 14 on the rim or flange 1. Engaging portions may also be formed upon the inner ends of the tongues 9 for cooperation with the bark of the tree around

which the device is placed or with the band 13 of packing material. According to one form of my invention these engaging portions 17 are produced by the pointed corners of the lips 12, the said corners being caused to project inwardly beyond the edges of the adjacent lips 12 by bending the free ends of said lips inwardly along the lines of the incisions 11 by which said lips are formed. The said engaging portions may also be produced by serrating the inner edges of the lips 12, as shown at 18.

Instead of bending the tongues 9 inwardly from the rim or flange 1 to form a sharp or abrupt angle said lips may be curved inwardly from the rim or flange 1, as shown at 9^a, to form an oval-shaped hood. Instead of providing the incisions 11 and the lips 12 at the inner ends of the tongues 9 for the purpose of causing the interlocking of said tongues one with the other each of the tongues 9^b may be curved upwardly and outwardly at its inner end to form a hook 19. The tongues 9^b overlap each other, as in the preferred form of my invention, and each of the hooks 19 engages or coöperates with the corresponding hook on the adjacent tongue or tongues to prevent separation of said tongues from each other and to maintain the same constantly in surface contact. When the hood, constructed as just described, is assembled, there will be formed by the hooks 19, around the inner edge of the top 2, an annular groove in which a contractile spring 7^a may be located. This spring provides, as in the case of the spring 7, for the expansion of the hood, but maintains the same in close frictional contact with the trunk of the tree or with the band 13 of packing material which surrounds the tree. When the last-mentioned form of my invention is used, the band 13 is secured in any suitable manner to the trunk of the tree and the inner ends of the tongues 9^b or the inner surfaces of the hooks 19 thereon lie in contact with the trunk of the tree above the band 13, and said hood is supported by its engagement with the upper edge of said band, the latter forming a ledge or shoulder for this purpose. Of course it is not necessary that the spring 7^a be located in the manner just described, as I may connect up with the hook form of said hood a spring similar to the spring 7, heretofore referred to.

I have heretofore described two different forms of clamps by which the meeting ends of the rim or flange 1 of the hood may be connected together with provision for sliding movement of one upon the other. Another form of clamp that may be employed is shown in connection with the hook form of hood, in which one of the tongues 9^b at one end of the rim 1 is bent downwardly upon the outside of said rim or flange and then upwardly upon the inner side of the opposite end of said flange, as shown at 20. The tongue 9^b at the opposite end of the flange 1 is bent downwardly along the inner surface thereof and thence upwardly along the outer surface of the other end of the flange, as shown at 21.

When the hook form of hood is employed, as above described, engaging portions for the same purpose that the engaging portions 17 and 18, heretofore referred to, are provided may be produced by slitting and bending inwardly the material of which the hooks 19 are made to form the prongs or projections 22, or the inner surfaces of said hooks may be provided with burs 23, formed by puncturing the material of which said hooks are made from the outside.

If desired, the lips 12, formed by the incisions 11 in the tongues 9, may be bent upwardly to form the vertical flanges 24, in which case the radially-arranged tongues fit, as before, in the incisions 11 of the adjacent tongues and are held in surface contact with each other by the engagement thereof with the lower edges of the flanges 24 instead of with the lower surfaces of the lips 12. This provides a somewhat more rigid construction than that originally described.

Now, as heretofore stated, it is the purpose to place this invention on the market in the form of blanks made from a continuous web of sheet metal or other material, so that the same may be cut up and assembled by the purchaser or user to the proper sizes of the different trees upon which the completed protector is to be used. The blank 25 therefore will be formed with the lateral slits 10 extending from one edge thereof to a point adjacent to the other edge forming the tongues 9, and said tongues will be formed with the incisions 11, producing the lips 12. When it is desired to assemble the same, the lips 12 are bent upwardly and the tongues 9 are bent inwardly along the inner ends of the slits 10, so that each of said tongues overlaps the adjacent one. When the tongues are bent downwardly in this manner, the lips 12 may also be bent downwardly, so as to lie in close contact with the inner ends of the adjacent tongues. It is then merely necessary to fold or bend the blank into annular form, apply the clamp or coupling device for the meeting ends of the rim 1, and connect up the spring 7. Of course the spring 7 is not applied until after the device is placed upon the tree, and prior or subsequent to the application of the device to the tree the rim 1 may be bent into the proper shape to cause the inner ends of the tongues 9 to conform to irregularities in the cross-section of the tree. When the hook form of protector is desired, the blank 26, from which the same is made, is merely provided with the lateral slits 10 and, if desired, with either the burs 23 or the prongs or projections 22. The hooks 19 on the ends of said tongues may be made by the user himself. Of course said hooks might be made in the blank by the manufacturer; but if this were done the blank could not be so conveniently rolled for shipment and sale.

In the form of my invention shown in Fig.

1 the interlocking of the tongues 9 with each other is produced by the formation of lips 12 on each of said tongues and in the form of my invention shown in Figs. 12 and 13 of the drawings the interlocking of the tongues 9^b is produced by hooks 19 on each of said tongues. The interlocking of the various tongues with each other may be effected by providing lips 12^a 12^b at the inner ends of the tongues 9^c 9^d, the said lips 12^a 12^b being formed on alternate tongues and extending toward each other. The tongue 9^e, which is located between the tongues 9^c 9^d, is formed with a plain inner end, which fits beneath the lips 12^a and 12^b. By this construction the tongue 9^e is interlocked with the two tongues 9^c 9^d on opposite sides thereof and the latter tongues are of course interlocked with each other through the medium of the tongue 9^e. The alternate tongues 9^f of the continuous series may be alone provided with hooks 19^a, beneath which the intermediate tongues 9^g fit. The said tongues 9^g are interlocked with the two tongues 9^f on opposite sides thereof, and said tongues 9^f are interlocked with each other through the medium of the tongues 9^g.

It will be understood, of course, that without the interlocking feature of construction between the various tongues of the hood it would be practically impossible to form a close-jointed hood out of light elastic material. The hood when adjusted to the tree may be painted to preserve the material of which it is made, although it is preferably coated with a non-drying petroleum product—as, for example, high-melting-point petrolatum—impregnated with insecticides, which serve to kill or repel insects. This provides perfectly close joints between the tongues of the hood and at the same time preserves the material of which the hood is made.

Having described my invention, what I claim is—

1. A tree-protector comprising a hood whose upper end is made up of a series of overlapping tongues having interlocking means thereon.

2. A tree-protector comprising a hood whose upper end is made up of a continuous series of substantially radially disposed tongues, the said tongues overlapping one another, and provided with interlocking means.

3. A tree-protector comprising a hood whose upper end is made up of a continuous series of substantially radially disposed tongues, the said tongues overlapping each other and being provided with integral interlocking means.

4. A tree-protector comprising a hood whose upper end is made up of a continuous series of substantially radially disposed tongues, the said tongues overlapping each other and provided at their inner ends with lips constituting interlocking means.

5. A tree-protector comprising an annular hood whose upper end is made up of a continuous series of substantially radially disposed tongues, the said tongues overlapping each other and provided at their inner ends with lips which constitute locking means for the adjacent tongues.

6. A tree-protector comprising an expansible annular hood made up of an outer rim and a continuous series of overlapping substantially radially disposed tongues constituting the top of said hood and integral with said rim, the said tongues being provided with interlocking means for maintaining the same in surface contact with each other.

7. A tree-protector comprising an expansible hood made up of an outer rim and a continuous series of substantially radially disposed tongues overlapping each other constituting the top of said hood and integral with said rim, the said tongues being provided at their inner ends with integral locking means for maintaining the same in surface contact with each other.

8. A tree-protector comprising an annular expansible hood made up of an outer rim and a continuous series of substantially radially disposed tongues overlapping each other constituting the top of said hood and integral with said rim, the said tongues being provided with lateral incisions forming lips, and said lips constituting interlocking means for maintaining said tongues in surface contact with each other.

9. A tree-protector comprising an annular expansible hood made up of an outer rim and a series of annularly-arranged overlapping tongues constituting the top of the hood, and provided with interlocking means and a clamp or clip for connecting the meeting ends of said hood.

10. A tree-protector comprising an annular expansible hood made up of an outer rim and a series of annularly-arranged overlapping tongues constituting the top of the hood, and provided with interlocking means and a clamp integral with said hood for connecting the meeting ends thereof.

11. A tree-protector comprising an annular expansible hood made up of a side flange or rim and a continuous series of overlapping tongues constituting the top, the said tongues being provided with interlocking means, means for connecting the meeting ends of said rim together with provision for sliding movement, and a contractile spring secured to one end of said hood and adjustably connected to the other.

12. A tree-protector whose upper end is made up of a series of overlapping interlocking tongues provided with engaging portions at their inner ends.

13. A tree-protector whose upper end is made up of a series of overlapping interlocking tongues provided with serrated inner edges.

14. A tree-protector comprising an annular expansible hood made up of a side flange and a continuous series of overlapping inter-

locking tongues, the inner ends of said tongues being provided with engaging means.

15. A tree-protector comprising an annular expansible hood made up of an outer side flange and a continuous series of overlapping tongues constituting the top and integral with said flanges, the said tongues being provided with transverse incisions forming lips for locking said tongues one to the other, and the inner ends of said tongues being provided with serrations.

16. A blank for the production of tree-protectors consisting of a continuous strip of sheet metal having lateral slits therein extending from one edge thereof to points adjacent to the other, forming tongues, and each of said tongues being provided with incisions extending at an angle to said slits.

17. A blank for the production of tree-protectors, consisting of a continuous strip of sheet metal having lateral slits therein, extending from one edge thereof to a point adjacent to the opposite edge, forming tongues, which tongues are provided with projections constituting engaging means.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAY HUNGERFORD SMITH.

Witnesses:
EMMA F. DAWSON,
I. CHAS. HASKIN.